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ABSTRACT

The intent of this guide is to define the scope and narrow the field of study as far as possible to the aeronautical knowledge required for qualifying for the private or commercial pilot (glider) certificate. Briefly summarized are type of test items used, hints for taking the test, and certificate requirements. The study outline is the basic framework of aeronautical knowledge that the prospective commercial pilot should know and be able to apply to pertinent situations. Topics of the study outline are: Federal aviation requirements, National Transportation Safety Board, safety investigation regulations, flight information publications and aeronautical charts, principles of flight, weather, navigation, sailplane operation and performance, sailplane structure and maintenance, flight instruments, towing, equipment, thermal soaring, ridge soaring, wave soaring, strange field landings, instrument flight, and airport traffic procedures. The two appendixes consist of recommended and optional study materials and sample test items with answers and explanations. (BP)

AC NO: AC 61-43A

DATE: 12 Jan 72

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: GLIDER PILOT WRITTEN TEST GUIDE - PRIVATE AND COMMERCIAL

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1. PURPOSE. This Advisory Circular is being issued to

   a. Outline the scope of the basic aeronautical knowledge requirements for a glider pilot,

   b. Acquaint the applicant with source material that may be used to acquire this basic knowledge, and

   c. Present a sample test along with correct answers and explanations.

2. CANCELLATION.

   AC No. 61-43, effective 30 November 1967, is canceled.

3. HOW TO GET THIS PUBLICATION.

   a. Order copies of this publication from:

      Department of Transportation
      Federal Aviation Administration
      Distribution Unit, TAD-484.3
      Washington, D.C. 20591

   b. Identify the publication in your order as:

      FAA Advisory Circular AC 61-43A
      Glider Pilot Written Test Guide - Private and Commercial

R. S. SLIFF
Acting Director, Flight Standards Service

Initiated by: AC-240

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CHAPTER 1. NATURE OF THE WRITTEN TEST

1. INTRODUCTION. This study guide is not offered as a quick and easy way to obtain the knowledge necessary for passing the written test. There is no quick and easy way to obtain the background of aeronautical experience, knowledge, and skill that the present-day pilot should acquire. Rather, the intent of this guide is to define the scope and narrow the field of study insofar as possible to the knowledge requisite for the Private or Commercial Pilot (Glider) Certificates.

2. TYPE OF TEST ITEMS. Test items on the FAA Written Tests are of the objective, multiple-choice type. Each can be answered by the selection of a single response from among four presented. This type of test has several advantages, two of which are: (1) rapidity in scoring, making it possible for the applicant to receive his grade as soon as possible, and (2) elimination of subjective scoring -- the element of individual judgment in determining the grade.

3. TAKING THE TEST. The equipment needed for taking the test includes a ruler and a protractor or plotter. A computer would be useful but is not required. Always bear in mind the following facts when you are taking the test:

   a. There are no trick items - each statement means exactly what it says. Do not look for hidden meanings, nor read into the test items something that is not intended. Unless specifically stated otherwise, test items do not concern exceptions to the rule -- they are based on the general rules.

   b. Always read the statement or question first -- before you look at the responses listed below it. Be sure you read the entire stem (initial statement or question of the test item) carefully, and understand its intent. Avoid "skimming" and hasty assumptions. This can lead to a completely erroneous approach to the test item or a failure to consider vital words.

   c. Work out your own answer before choosing from the list of responses the one which you consider to be the best. Remember that only one of the alternative answers or responses is completely correct. Others may be correct as far as they go, but are not complete or they are answers based on erroneous assumptions, misconceptions, or incorrect procedures and interpretations.

   d. Each test item is independent of other test items. That is, the correct response to one item is not based on the correct response to a previous item, although occasionally the same factors may be used.

e. If you find that you have considerable difficulty with a particular test item, do not spend too much time on it. Go on to the next item. When you reach the end of the test, go back to any items which you have passed over previously. This will enable you to use the available time to maximum advantage in demonstrating your knowledge and understanding of the subject.

4. CERTIFICATE REQUIREMENTS. General qualifications for a Private Pilot or Commercial Pilot Certificate require of the applicant a combination of aeronautical experience, knowledge, and skill. An applicant for a Private or Commercial Pilot certificate with a glider rating should carefully review the applicable sections of Federal Aviation Regulations, Part 61, for detailed information on these qualifications.

NOTE: Comments regarding this publication should be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

CHAPTER 2. STUDY OUTLINE FOR THE PRIVATE AND COMMERCIAL PILOT GLIDER WRITTEN TESTS

5. INTRODUCTION. This study outline is the framework of basic aeronautical knowledge that the prospective private or commercial pilot should know and be able to apply to pertinent situations. Every test item can be directly related to one or more of the topics contained in this outline. Frequently, topics may overlap when the situation demands the application of several knowledge areas to arrive at the complete solution of a problem. This subject matter is predicated on operationally realistic airman activity and encompasses the requirements specified in Federal Aviation Regulations. Many of the topics in this outline are referenced to a few of the sources of information.

6. FEDERAL AVIATION REGULATIONS. Have knowledge of:

a. Pilot privileges and limitations (FAR Part 61).

b. Recency of experience requirements (FAR Part 61).

c. Pilot certificates (FAR Part 61).

d. Pilot medical certificates (FAR Part 61).

e. Pilot responsibilities and preflight actions (FAR Part 91).

f. Aircraft maintenance and inspection requirements (FAR Part 91).

g. Aircraft certificates and documents (FAR Part 91).

h. General operating rules (FAR Part 91).

i. General flight rules (FAR Part 91).

j. Visual flight rules (FAR Part 91).

k. Operating rules at airports (FAR Part 91; Airman's Information Manual).

l. Airport traffic signals and markings (FAR Part 91; Airman's Information Manual).

7. NATIONAL TRANSPORTATION SAFETY BOARD, SAFETY INVESTIGATION REGULATIONS. Have knowledge of:

a. Part 430, Rules pertaining to aircraft accidents, incidents, overdue aircraft and safety investigations.

8. FLIGHT INFORMATION PUBLICATIONS AND AERONAUTICAL CHARTS.

a. Have knowedge of:

(1) Airman's Information Manual - General Information (AIM).

(2) Aeronautical Chart Symbols (Sectional Aeronautical Chart).

(3) Special Use Airspace - Restricted Areas, Prohibited Areas, Intensive Student Jet Training Areas, etc. (Sectional Aeronautical Charts).

(4) Controlled airspace boundaries (Sectional Aeronautical Charts; AIM; FAR Parts 1, 71).

(5) Significance of airport landing and runway designations (AIM).

b. Be able to:

(1) Obtain airport facility information (AIM; Sectional Aeronautical Chart).

(2) Select appropriate aeronautical charts (Sectional Aeronautical Chart).

(3) Determine terrain and obstruction clearance (Sectional Aeronautical Chart).

(4) Relate FAR flight rules to airport symbols or data.

(5) Relate FAR flight rules to chart elevations.

(6) Relate FAR flight rules to controlled airspace symbols.

(7) Relate FAR flight rules to restricted or prohibited areas.

9. PRINCIPLES OF FLIGHT. Have knowledge of:

a. The three forces acting upon a sailplane.

b. The function of an airfoil.

c. Relative wind.

d. Angle of attack.

e. The relationship between lift and gravity.

f. The relationship of angle of attack and lift.

g. The effects of drag.

h. The effect of airspeed on lift and drag.

i. The axes of a sailplane.

j. Stalls.

k. Spins.

l. Slips.

m. Skids.

n. The use of spoilers, flaps, and dive brakes.

o. The function of the controls.

p. Loads and load factors.

10. WEATHER.

a. Have knowledge of:

(1) The nature of the atmosphere.

(2) The significance of atmospheric pressure.

(3) The measurement of atmospheric pressure.

(4) The cause of atmospheric circulation.

(5) Wind patterns.

(6) Convection currents.

(7) Effect of obstructions on surface wind.

(8) The effects of moisture and temperature on the atmosphere.

(9) Temperature/dewpoint relationship.

(10) Relative humidity.

(11) Effect of temperature on air density.

(12) Effect of air density on flight.

(13) The lifting devices of weather (thermals, ridge lift, mountain waves).

(14) The determination of a ceiling.

(15) The determination of flight and ground visibility.

(16) Characteristics of a cold air mass.

(17) Characteristics of a warm air mass.

(18) Characteristics of a cold front.

(19) Characteristics of a warm front.

(20) Characteristics of an occluded front.

(21) Aviation weather forecasts and reports -- availability and schedule for issuance.

b. Be able to:

(1) Interpret area forecasts.

(2) Interpret terminal forecasts.

(3) Interpret winds aloft forecasts.

(4) Interpret aviation weather (hourly sequence) reports.

(5) Determine the general situation as depicted by the weather map.

11. NAVIGATION.

a. Have knowledge of:

(1) The aeronautical chart.

(a) topographic symbols.

(b) aeronautical symbols.

(c) other landmarks.

(2) The measurement of direction.

(a) measurement of courses.

(b) magnetic variation.

(3) The measurement of distance.

(4) The principles of pilotage.

(5) The principles of dead reckoning.

b. Be able to:

(1) Estimate the effect of wind.

(2) Calculate time, speed, and distance.

(3) Convert knots to miles per hour.

(4) Convert centigrade temperatures to Fahrenheit.

(5) Determine groundspeed during flight.

12. SAILPLANE OPERATION AND PERFORMANCE. Have knowledge of:

a. The various airspeeds.

(1) Stalling.

(2) Buffeting.

(3) Minimum sinking.

(4) Best glide angle.

(5) Towing.

(6) Maximum.

b. Operations Limitations.

(1) Aircraft Flight Manual.

(2) Placards.

c. The principles of gliding.

(1) L/D (glide ratio).

(2) Effect of headwinds and tailwinds on glide ratio.

13. SAILPLANE STRUCTURE AND MAINTENANCE. Have knowledge of:

a. The fuselage.

(1) Different types.

(2) Components of.

b. The wings.

(1) Different types.

(2) Flaps, spoilers, and dive brakes.

c. The control surfaces.

(1) Ailerons.

(2) Elevators.

(3) Rudder.

d. The procedure of assembly and disassembly.

e. Preflight inspection procedures.

14. FLIGHT INSTRUMENTS. Have knowledge of:

a. The pitot-static system.

(1) Altimeter.

(2) Airspeed indicator.

(3) Vertical speed indicator.

b. The magnetic compass.

c. The gyro instruments.

(1) Turn-and-slip (bank) indicator.

(2) Attitude indicator.

15. TOWING. Have knowledge of:

a. The principles of winch towing.

(1) Techniques.

(2) Precautions.

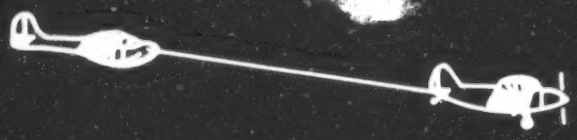
b. The principles of auto towing.

(1) Techniques.

(2) Precautions.

AC 61-43A

GLIDER PILOT WRITTEN TEST GUIDE-
PRIVATE AND COMMERCIAL



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c. The principles of aero towing.

(1) Techniques.

(2) Precautions.

16. EQUIPMENT. Have knowledge of:

a. The regulations pertaining to parachute inspection.

b. The installation and use of oxygen equipment, and of the effects of insufficient oxygen (hypoxia).

c. The use and limitations of tow ropes, cables, or wires.

d. VHF radio characteristics.

17. THERMAL SOARING. Have knowledge of:

a. The types of thermals.

(1) Cloud indicated.

(2) Dry.

b. The methods for determining the existence of thermals.

(1) By weather forecasts.

(2) By visual references.

c. The life cycle of thermals.

d. The phenomena of cloud streets.

18. RIDGE SOARING. Have knowledge of:

a. The influence of terrain features.

b. The importance of wind components.

c. The effective lift to be expected.

19. WAVE SOARING. Have knowledge of:

a. The influence of terrain features.

b. The importance of wind components.

c. The effective lift to be expected.

d. The techniques involved in wave soaring.

e. The hazards associated with wave soaring.

20. STRANGE FIELD LANDINGS. Have knowledge of:

a. The factors involved in a landing field selection.

(1) Surface wind.

(2) Obstructions.

(3) Surface and slope of the field.

(4) Altitude remaining.

b. The recommended approaches.

(1) Types of patterns.

(2) Altitude vs. traffic patterns.

c. The precautions to take after landing.

21. INSTRUMENT FLIGHT. Have knowledge of:

a. What constitutes instrument flight.

b. The techniques for avoiding unintentional instrument flight.

22. AIRPORT TRAFFIC PROCEDURES. Have knowledge of:

a. The standard airport traffic patterns.

(1) Determining direction of traffic.

(2) Determining landing direction.

b. The standard airport markings and facilities.

c. The standard light signals.

d. The regulations for airport traffic right-of-way.

APPENDIX 1. RECOMMENDED STUDY MATERIALS

NOTE: References listed were available at the time this publication went to press.

SECTION 1. BASIC LIST OF STUDY MATERIALS

1. THE AMERICAN SOARING HANDBOOK

   a. THE AMERICAN SOARING HANDBOOK, CHAPTER 2 - TRAINING ($1.00).

   b. THE AMERICAN SOARING HANDBOOK, CHAPTER 3 - GROUND LAUNCH ($1.00).

   c. THE AMERICAN SOARING HANDBOOK, CHAPTER 4 - AIRPLANE TOW ($1.00).

   d. THE AMERICAN SOARING HANDBOOK, CHAPTER 5 - METEOROLOGY ($1.00).

   e. THE AMERICAN SOARING HANDBOOK, CHAPTER 6 - CROSS COUNTRY AND WAVE SOARING ($1.00).

   f. THE AMERICAN SOARING HANDBOOK, CHAPTER 7 - EQUIPMENT I, INSTRUMENTS AND OXYGEN ($1.00).

   g. THE AMERICAN SOARING HANDBOOK, CHAPTER 8 - EQUIPMENT II, RADIO, ROPE AND WIRE ($1.00).

      Published by the Soaring Society of America. This handbook represents the combined efforts of many of the veteran soaring pilots in this country. Each chapter is a separate booklet.

   h. THE JOY OF SOARING ($5.75) A Training Manual, that is the latest in a series of publications by the Soaring Society of America, designed to promote not only enjoyment, but proficiency and safety in soaring activities. It supplements the American Soaring Handbook, and the monthly magazine "Soaring." It is the most comprehensive and authoritative description of training techniques available to the beginner or experienced pilot.

2. FEDERAL AVIATION REGULATIONS

   a. Part 1 - Definitions and Abbreviations. A listing of definitions and abbreviations applicable to all Federal Aviation Regulations.

   b. Part 61 - Certification: Pilots and Flight Instructors. Contains the requirements and procedures for pilot certification and the privileges and limitations of the various certificates.

c. Part 91 - General Operating and Flight Rules. The applicant must demonstrate a thorough knowledge of this Regulation with the exception of that portion which pertains to Instrument Flight Rules.

The applicant is responsible for knowing applicable portions of Parts 61 and 91, which in turn will require a knowledge of some portions of Parts 1 and 71.

The regulations are published by FAA in Volumes containing related FAR Parts. As amendments are issued, they will be furnished as page revisions to the pertinent Parts by numbered transmittal sheets.

The applicable volume structure is:

Volume	FAR Part	Price
I	1	$1.50
VI	91, 93, 99, 101, 103, 105.	$5.50
IX	61, 63, 65, 67, 141, 143, 147.	$6.00
XI	71, 73, 75, 77, 95, 97, 157, 169, 171.	$2.75

3. NATIONAL TRANSPORTATION SAFETY BOARD. Investigation Regulations, Part 430 (free). Prescribes the procedures and requirements pertaining to aircraft accidents and certain other incidents involving aircraft.

Order from:

National Transportation Safety Board
Publications Branch, NE-55
800 Independence Avenue, S. W.
Washington, D. C. 20591

SECTION 2. OPTIONAL STUDY MATERIALS

4. PILOT'S HANDBOOK OF AERONAUTICAL KNOWLEDGE, AC 61-23A (in print), is designed as a text of basic aeronautical knowledge for the airplane pilot. However, most of the chapters are applicable to private and commercial glider pilot applicants.

5. AVIATION WEATHER, AC 00-6 ($4.00), is a joint FAA/Weather Bureau publication which provides a comprehensive text for pilots and flight operations personnel. Gives the pilot a practical understanding of those meteorological principles important to aviation and essential to his effective use of current and forecast weather information. Includes extensive material on present aviation weather services, a chapter on soaring weather, a glossary of meteorological terms, and over 175 illustrations, many in color.

6. AIRMAN'S INFORMATION MANUAL (AIM). The Airman's Information Manual has been designed primarily as a pilot's operational and information manual for use in the National Airspace System of the United States. It is divided into four basic parts, each of which may be purchased separately.

Highlights of each part are described below:

PART 1 - Basic Flight Manual and ATC Procedures. This part is issued quarterly and contains basic fundamentals required to fly in the National Airspace System; adverse factors affecting Safety of Flight; Health and Medical Facts of interest to pilots; ATC information affecting rules, regulations and procedures; a Glossary of Aeronautical Terms; Air Defense Identification Zones (ADIZ); Designated Mountainous Areas; and Emergency Procedures. Annual subscription price $4.00 for U.S., Canada, and Mexico, plus $1.00 for other foreign mailing.

PART 2 - Airport Directory. This part is issued semiannually and contains a Directory of all Airports, Seaplane Bases, and Heliports in the conterminous United States, Puerto Rico, and the Virgin Islands which are available for civil use. It includes all of their services, except communications, in codified form. (Those airports with communications are also listed in Part 3.) Also included in Part 2 are U.S. Entry and Departure Procedures, including Airports of Entry and Landing Rights Airports; and a listing of Flight Service Station and Weather Bureau Telephone Numbers. Annual subscription price $4.00 for U.S., Canada and Mexico, plus $1.00 for other foreign mailing.

PART 3 and 3A - Operational Data and Notices to Airmen. Part 3 is issued every 28 days and covers the conterminous U.S., Puerto Rico, and the Virgin Islands. Part 3 contains an Airport-Facility Directory of all major airports with communications; a tabulation of Air Navigation Radio Aids; Preferred Routes; a listing of Standard Instrument Departures (SIDs); Standard Terminal Arrival Routes (STARs); Substitute Route Structures; Sectional Chart Bulletin (which updates C&GS Sectional Charts cumulatively); Special, General and Area Notices; a tabulation of New and Permanently Closed Airports (which updates Part 2), Area Navigation Routes, and supplemental data to Part 4.

Part 3A is issued every 14 days and contains Notices to Airmen considered essential to the safety of flight, as well as supplemental data to Parts 3 and 4. Annual subscription price $20.00 for U.S., Canada and Mexico, plus $5.00 for other foreign mailing.

PART 4 - Graphic Notices and Supplemental Data. Part 4 is issued semiannually and covers the conterminous U.S., Puerto Rico, and the Virgin Islands. Part 4 contains a list of abbreviations used in the AIM; a tabulation of Parachute Jump Areas; locations of VOR Receiver Check Points (both Ground and Airborne); Restrictions to Enroute Navigation Aids; Special Notice---Area Graphics; and Heavy Wagon and Oil Burner Routes. Future editions will be expanded to include additional Terminal Area Graphics and other data not requiring frequent change. Annual Subscription price $1.50 for U.S., Canada and Mexico, plus $0.50 for other foreign mailing.

* * * * * *

NOTE: Similar information for Alaska and Hawaii appears in Alaska Supplement and Pacific Chart Supplement, respectively (for Part 2, Parts 3 and 3A, and Part 4).

WHERE TO PURCHASE AIM

The four basic parts described above are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Orders should be accompanied by check or money order made payable to the Superintendent of Documents.

SECTION 3. HOW TO OBTAIN STUDY MATERIALS

7. THE AMERICAN SOARING HANDBOOK and THE JOY OF SOARING may be obtained from bookstores, sailplane operators, or ordered from:

The Soaring Society of America
Box 66071
Los Angeles, California 90066

8. OTHER STUDY MATERIALS. You may obtain a copy of the FAA Advisory Circular Checklist and Status of Federal Aviation Regulations, as shown in the Federal Register, free of charge upon request from:

Distribution Unit, TAD-484.3
Department of Transportation
Washington, D.C. 20590

This checklist contains Advisory Circulars that are for sale, as well as those distributed free of charge by the FAA. When a price is listed after the description of a circular, it means that this circular is for sale by the Superintendent of Documents, U.S. Government Printing Office.

HOW TO GET GPO PUBLICATIONS PROMPTLY

(1) Use an order form, not a letter, unless absolutely necessary. Order forms may be duplicated by the user. See sample Order Blank on next page.
(2) Send separate orders for a subscription and a nonsubscription item.
(3) Get the exact name of the publication and the agency number.
(4) Send a check, not cash. Send the exact amount.
(5) Enclose a self-addressed mailing label if you have no order blank.
(6) Use special delivery when needed.
(7) Use GPO bookstores.

The retail GPO bookstores now in being are located at the following addresses:

GPO Bookstore
Federal Building, Room 1
275 Peachtree Street, N.E.
Atlanta, Georgia 30303
Tel: 404 526-6946

GPO Bookstore
J. F. Kennedy Federal Bldg.
Sudbury Street, Room G25
Boston, Massachusetts 02203
Tel: 617 233-6071

GPO Bookstore
Room 1463, 14th Fl., Federal Bldg.
219 South Dearborn Street
Chicago, Illinois 60604
Tel: 312 353-5133

GPO Bookstore
Federal Building
U.S. Courthouse, Room 1046
1100 Commerce Street
Dallas, Texas 75202
Tel: 214 749-1541

GPO Bookstore
Federal Building, Room 135
601 East 12th Street
Kansas City, Missouri 64106
Tel: 816 374-2160

GPO Bookstore
Federal Building
300 North Los Angeles Street
Los Angeles, California 90012
Tel: 213 688-5841

GPO Bookstore
Federal Building, Room 1023
450 Golden Gate Avenue
San Francisco, California 94102
Tel: 415 556-6657

GPO Bookstore, USIA
First Floor, USIA Building
1776 Pennsylvania Avenue, N.W.
Washington, D.C. 20547
Tel: 202 783-3238

APPENDIX 2. SAMPLE TEST

The following test items are included for one purpose--to familiarize you with the type of items you may expect to find on the FAA test. You should keep in mind that the test is, at best, a sampling of your aeronautical knowledge. It is for this reason that you should concentrate on the Chapter entitled STUDY OUTLINE FOR THE PRIVATE AND COMMERCIAL PILOT GLIDER WRITTEN TESTS. A knowledge of all the topics mentioned in this outline--not just the mastery of the sample test items--should be used as the criterion for determining that you are properly prepared to take the FAA written test and meet the aeronautical knowledge requirements for the Private or the Commercial Pilot Certificate. The correct responses, with explanations, are presented immediately following this sample test.

SECTION 1. SAMPLE TEST ITEMS

1. Federal Aviation Regulations require careful preflight planning

   1- only on flights that are conducted off-airways.
   2- on all cross-country flights.
   3- only on flights for hire.
   4- only on flights which carry passengers.

2. An aircraft in distress has the right-of-way over

   1- all other aircraft.
   2- all other aircraft except a glider on final approach.
   3- only those aircraft not engaged in landing or taking off.
   4- all other aircraft except a glider on tow.

3. The principal value of the surface weather chart to you as a pilot lies in the fact that such a chart enables you to

   1- forecast the weather conditions at the airport or point of destination.
   2- forecast the weather conditions along your intended route.
   3- plot a course which will enable you to avoid weather hazards enroute.
   4- get a broad picture of the fronts and pressure patterns existing over the area through which you plan to fly.

4. Consider the following Aviation Weather Report for Dayton, Ohio, where the field elevation is 1,008 feet:

   DAY 20ØE50Ø15 003/59/48 1810G15/955

   While flying over this airport you would expect to encounter the base of the clouds which exist at the ceiling height at approximately

   1- 6,000 feet MSL.
   2- 5,000 feet MSL.
   3- 4,000 feet MSL
   4- 3,000 feet MSL.

5. Assume that your sailplane was designed for an L/D or glide ratio of 15-1 at 40 mph. What would the approximate glide ratio be with a direct headwind of 20 mph?

   1- 10 to 1.
   2- $7\frac{1}{2}$ to 1.
   3- 5 to 1.
   4- $12\frac{1}{2}$ to 1.

6. The following placard appears on the instrument panel of your sailplane:

   Minimum Pilot Weight . . . . . 135 lbs.
   Maximum Pilot Weight . . . . . 210 lbs.
   (Seat ballast must be used as necessary.)

   If your weight is 115 pounds, what action would be necessary to comply with this operating limitation?

   1- Add a minimum of 20 pounds of ballast to the seat.
   2- Add 20 pounds of ballast anywhere in the cockpit.
   3- Add 20 pounds of ballast in the area aft of the seat.
   4- Adjust the elevator bungee trim to compensate for your weight.

7. The most likely error by the sailplane pilot during airplane tow, while maintaining the "high tow" position, is allowing the sailplane to get too

   1- low.
   2- far left.
   3- far right.
   4- high.

8. Assume the sailplane cannot release the tow line. How does a sailplane pilot signal the tow pilot of this condition?

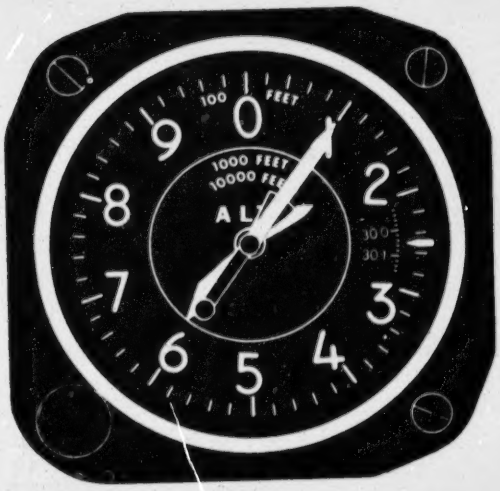
   1- Move from high tow to low tow.
   2- Turn steeply in either direction.
   3- Move to a very high tow position and fishtail the rudder.
   4- Move to a position in visual range of the tow pilot and actuate all flight control surfaces.

9. As you maneuver the sailplane in the traffic pattern you are aware that a stall this close to the ground is dangerous. A sailplane can be stalled

   1- only when the nose is high and the airspeed is low.
   2- only when the nose is high in relation to the horizon.
   3- only when the airspeed is at or below the published stalling speed.
   4- at any airspeed and any flight attitude.

A

B



C

D

10. Which of the altimeters illustrated indicates 6,100 feet?

1- A.
2- B.
3- C.
4- D.

11. The intensity of the vortices associated with the wake turbulence of large aircraft is greatest when such airplanes are operating at

    1- low airspeeds and high gross weights.
    2- high airspeeds and high gross weights.
    3- high airspeeds and low gross weights.
    4- low airspeeds and low gross weights.

12. The action that is recommended to preclude the effects of hypoxia, is to

    1- avoid hyperventilation (rapid, heavy breathing), which causes excess carbon dioxide in the bloodstream.
    2- avoid flying above 10,000 feet MSL for prolonged periods without breathing supplemental oxygen.
    3- ensure that carbon monoxide is not entering the cockpit.
    4- avoid flying at high altitudes immediately after SCUBA diving.

13. In using the magnetic compass to establish and maintain a heading, you should always remember that, due to the normal characteristics of a compass, it will usually indicate a turn toward the

    1- west when entering a right turn from a north heading.
    2- south when accelerating on an east heading.
    3- north when decelerating on a west heading.
    4- east when entering a right turn from a south heading.

14. Federal Aviation Regulations are specific regarding right-of-way rules. Assume that during your flight in a single-place sailplane, you encounter a large two-place sailplane at your altitude. The large sailplane is approaching from your right on an apparent collision course. Which sailplane should give way, and why should it give way?

    1- You should give way since the other sailplane is less maneuverable.
    2- Both sailplanes should change altitude. You should descend and the large sailplane should climb.
    3- You should give way since the large sailplane is on your right.
    4- The large sailplane should give way since your sailplane is to its left.

SECTION 2. ANSWERS AND EXPLANATIONS TO THE SAMPLE TEST ITEMS

1. (2) FAR 91.5 Preflight Action, states: "Each pilot in command shall, before beginning a flight, familiarize himself with all available information concerning that flight. This information must include, for a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which he has been advised by ATC."

2. (1) FAR 91.67 currently states in part: ". . . An aircraft in distress has the right-of-way over all other air traffic. . ."

3. (4) Aviation Weather (Chapter 16) states in part: ". . . the pilot should concentrate on pressure patterns and fronts more than on plotted data on the surface chart. More up-to-date weather data are available through the Aviation Weather Reports. . ."

4. (1) The reported ceiling is measured from the surface at the point of observation to the base of the phenomena forming the ceiling. Since the elevation of the surface at Dayton is 1,008 feet MSL and the reported ceiling is 5,000 feet above the surface, the base of the clouds at the ceiling height would be encountered at 6,000 feet MSL. Thus, response number 1 is correct while numbers 2, 3, and 4 are incorrect.

5. (2) Gliding at an airspeed of 40 mph into a 20 mph headwind results in a groundspeed of 20 mph. Since the rate of sink will be the same, your glide ratio will therefore be approximately one-half of the design L/D (glide ratio in still air). If the situation were reversed; i.e., gliding at 40 mph with a 20 mph tailwind, the groundspeed would be 60 mph. In this case, the glide ratio would be approximately one and one-half times the design L/D.

6. (1) If it becomes necessary to add ballast or weight to comply with loading instructions, then the placement of this weight is as important as the amount. Remember, you are concerned not only with the total weight of the sailplane but its balance as well. Always follow loading instructions or placards exactly. (Reference, Pilot's Handbook of Aeronautical Knowledge, Section VI.)

7. (4) The American Soaring Handbook, Chapter 4, "Airplane Tow," page 24, states in part, ". . . the easiest error to make (when in high tow) is to get too high . . ."

8. (4) The American Soaring Handbook, Chapter 4, "Airplane Tow," page 40, states in part ". . . if the sailplane pilot is unable to release the rope, he should move to a position in visual range of the tow pilot, then rotate stick in a circle and fishtail the rudder, thus actuating all control surfaces. . ."

9. (4) A stall is always the result of exceeding the critical angle of attack. This can occur not only at low airspeeds or nose high attitudes, but also when excessive or sudden back pressure is applied as in a pull-up from a high-speed dive, steep turn, or any other attitude. Accelerated stalls of this type may occur well above the established stalling speed. Therefore, the conditions described in response numbers 1, 2, and 3 are not the only conditions in which a stall can occur. Response number 4 is the only correct answer.

10. (2) Altimeter "A" indicates 610 feet; Altimeter "C" indicates 16,100 feet; Altimeter "D" indicates 6,610 feet.

11. (1) Airman's Information Manual, Part 1, states in part: "The strength of a vortex is governed primarily by the weight, speed, and shape of the wing of the generating aircraft. The basic factor is weight, and the vortex strength increases with increases in weight and span loading. The greatest vortex strength occurs when the generating aircraft is HEAVY - CLEAN - SLOW."

12. (2) Airman's Information Manual, Part 1, covers the subject of hypoxia and states in part: "The symptoms are slow but progressive, insidious in onset, and are most marked at altitudes starting above ten thousand feet." If you observe the general rule of not flying above ten thousand feet without supplemental oxygen, you will not get into trouble.

13. (1) The Pilot's Handbook of Aeronautical Knowledge, Section V, discusses the magnetic compass and states in part: "If the aircraft is on a northerly heading and a turn is made toward east or west, the indication of the compass lags or indicates a turn in the opposite direction. If the aircraft is on an east or west heading, an increase in airspeed causes the compass to indicate a turn toward north. If the aircraft is on an east or west heading, a decrease in airspeed causes the compass to indicate a turn toward south. If the aircraft is on a southerly heading and a turn is made, the compass needle will indicate a greater amount of turn than is actually made."

14. (3) FAR 91.67 states in part: "(c) Converging. When aircraft of the same category are converging at approximately the same altitude (except head-on, or nearly so) the aircraft to the other's right has the right of way." FAR 1.1 defines "category" as follows: "(1) As used with respect to the certification, ratings, privileges, and limitations of airmen, means a broad classification of aircraft. Examples include: airplane; rotorcraft; glider; and lighter-than-air;. . ." Response 3 is correct since both aircraft are of the same category (glider) and the other aircraft is converging on your right.

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